

**New Estuarine and Intertidal Water Striders
from Mexico and Costa Rica**

(Hemiptera: Gerridae, Mesoveliidae)

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The water striders described here are from localities having a marine influence, and are published so that the names will be available for a forthcoming work on marine insects. I am indebted to Dr. Paul Arnaud, Jr. and Vincent Lee of the California Academy of Sciences for making material available for study, to Lanna Cheng for calling my attention to the *Speovelia* from Baja California, and to Dr. Charles Hogue for suggesting that I investigate the Boca de Barranca area in Costa Rica.

For all measurements 60 units = 1 mm, except where given in mm. Types held in the Polhemus collection are irrevocably committed to later placement in a designated type repository.

FAMILY GERRIDAE

***Rheumatobates prostatus*, n. sp.**

Length, apterous male, 2.5 mm; macropterous forms unknown. Color; deep brown to black; dorsum of thorax and abdomen mostly frosted; connexiva, postero-lateral portion of thorax, head except median longitudinal stripe, orange brown; broad medial area of pronotum, propleura, venter of head and thorax yellowish to leucine. Antenna brown, lighter ventrally and on base of segment I. Fore femur and acetabula yellowish brown, remainder of legs brown, lighter ventrally. Rostrum infuscated.

Structural characteristics. Antenna, hind legs and abdominal segments of male modified. Antennal formula I-IV: male, 34:4:32:26; female, 25:5:24:22. Male antennal segment I swollen, thickest at middle (7), thickly set with anteriorly directed bristles longer than width of segment where they arise; segment III slender, slightly curved and thinned distally with about 14-16 anteriorly and ventrally directed long bristles on basal third, one long anteriorly directed bristle near distal end; segment IV curved, with 9 long (7) ventrally directed bristles set in a regular row on the inside of the curvature. Head of male long (32), broad (28 across antennal tubercles), shorter (26) and narrower (25) in female; vertex moderately convex in male, less so in female. Male abdominal dorsum broadly, transversely depressed, tergite II lowest. Venter of abdomen modified so that ventrite IV is produced into an anteriorly directed protuberance, flanked by a raised portion of ventrite III; ventrites II-VI converging on this protuberance; entire median venter deeply excavate cephalad of ventrite VII; anterior margin of

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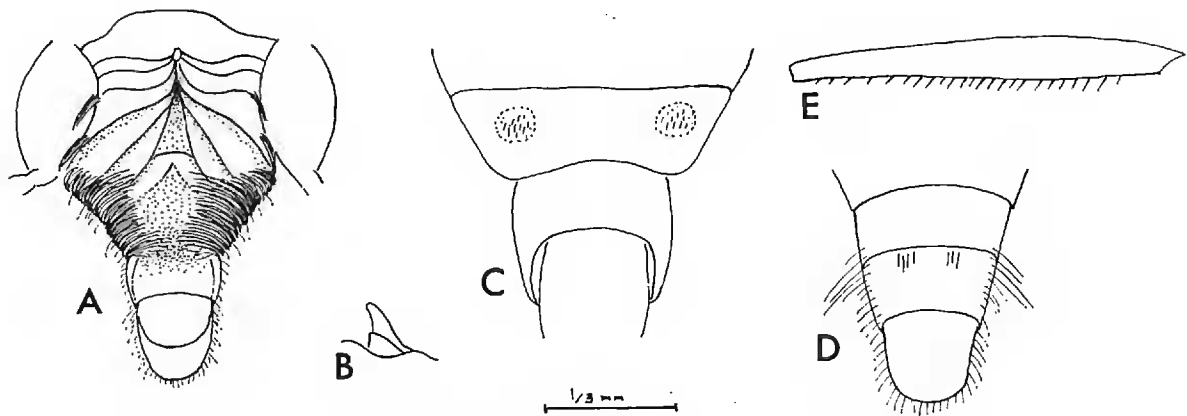


FIG. 1. A-B. *Rheumatobates prostatus* n. sp. A. Male abdominal venter. B. Side view, ventral projection, male. C. *Speovelia mexicana* n. sp., male abdominal venter. D-E. *Mesovelia halirryta* n. sp. D. Male ventral genital segments. E. Male middle femur.

ventrite VII broadly raised, then deeply excavate caudad; ventrites III and IV laterally with long ventrally directed tufts of hair; ventrites V and VI laterally with enormous brushes of very long curved hairs arising from lateral margins, curving inward and almost touching over midline of venter (Figure 1 A,B). Connexiva of male almost vertical, flatter in female. Male genital segments turned down slightly. Fore femur with an anterior basal knob, set with a few spines along posterior margin. Anterior tarsal claws slightly spatulate, otherwise unmodified. Posterior trochanter set with four long spines beneath; posterior femur slightly curved and set with long, slender decumbent hairs.

Material: *Holotype* (δ), and paratypes, 22 δ δ , 37 f f (all apterous) and 53 nymphs, COSTA RICA, BOCA DE BARRANCA, CL1305, 1-7-1970, J. T. Polhemus (in J. T. Polhemus collection).

Discussion: This species is the third in a complex comprising *prostatus*, *R. aestuarius* Polhemus and *R. carvalhoi* Drake and Harris, but is easily separated from the others by the highly modified ventrites which form a protuberance. For a discussion of *aestuarius* and *carvalhoi*, see Polhemus (1969). All of these species have long brushes of abdominal ventral hairs forming an arch over the venter. Cheng and Lewin (1971) discussed the possibility that these were pheromone dispersal structures, but I am convinced that they and the depressed venter form a tunnel into which the female abdomen fits during copulation.

Ecology: Specimens of this insect were collected from an estuary where a large river enters the Pacific Ocean. They were not seen in the broad area just inside the bar near the ocean, but were taken perhaps $\frac{1}{2}$ mile inland from the sea. Specimens were also collected in a shaded pond full of sticks and heavy vegetation that is apparently connected to the estuary at high tide. *Limnogonus* and *Mesovelia* also inhabited this pond, which is in a lowland tropical jungle and must experience rather large changes of salinity, as another pond only slightly deeper

in the forest showed no evidence of marine influence but indicated an abundance of fresh groundwater.

FAMILY MESOVELIIDAE

Mesovelia halirrhyta, n. sp.

Ground color yellowish brown; legs and two basal antennal segments luteous; distal two antennal segments brown; venter yellowish, embrowned laterally. Thorax frosted on sides. Pronotum short, posterior margin straight; midline lengths of pronotum:mesonotum:metanotum/13:13:8. Body, legs and antenna set with very short decumbent pubescence. First antennal segment with 1 long (8) anteriorly directed thin setae at distal three fourths; antennal segments II, III and IV set with many long, thin setae. Legs with numerous longer thin hairs, hind tibia with scattered stiff brown setae. Male fore femur armed beneath with 14 black spines, their lengths $\frac{1}{4}$ to $\frac{1}{2}$ of the width of the femur where they arise; middle femora armed beneath with 25 black spines of similar proportional lengths. Female fore and middle femora similarly armed with 9 and 16 spines, respectively. Head long (30), broadened anteriorly to antennal tubercles, wide across tubercles (22); with median sulcus posteriorly, reaching caudal margin, becoming evanescent anteriorly between eyes; eyes large (width of eye/interocular space: 9/14) with many ommatidia, converging anteriorly; length 15; width of eye:interocular space/10:13. Antenna long, slender, segment I stoutest; proportions I-IV, 33:25:47:48. Abdominal tergites I-VI subequal in length, with II and VI slightly longer (8-9) than the others (each 7). Median pore at anterior $\frac{1}{4}$ of tergite IV.

All femora stout, tibia and tarsi slender; proportions of legs:

	Femur	Tibia	Tarsal 1	Tarsal 2	Tarsal 3
Anterior	51	43	2	6	6
Middle	59	57	2	8	6
Posterior	76	97	3	13	10

First genital segment of male armed at anterior margin with two groups (1 + 1) of 3 or 4 posteriorly directed thin brown spines. Male parameres small, curved, elongate.

Male (holotype) length 2.50 mm, width (across abdomen) 0.7 mm; female length 2.75 mm, width (across abdomen) 1 mm.

Material examined: *Holotype* (apterous ♂) and paratypes, 3 ♂♂, 5 ♀♀, all apterous, COSTA RICA, BOCA DE BARRANCA, CL 1305, 1-7-1970, J. T. Polhemus (in J. T. Polhemus collection).

Discussion: *Mesovelia halirrhyta* may be easily separated from its congeners by the placement, nature and number of thin spines on the first genital segment, and by the armature of the fore and middle femora. In genital armature, it most closely resembles *Mesovelia horvathi* Lundblad, but the legs are greatly different in the two species. Other American species have armed femora, but at most 8-10 spines on any male femur (e.g. *M. mulsanti* White, *M. hambletoni* Drake and Harris).

Ecology: These specimens were taken in a pond beside an estuary.

For a discussion of this site, and the associated fauna, see the notes under *Rheumatabates prostatus* n. sp. in this paper.

Speovelia mexicana, new species

Ground color light brown; femora and antenna luteous; femora distally, first two antennal segments, genital segments lightly embrowned; venter orange brown. Pronotum with posterior margin sinuate, midline lengths of pronotum:mesonotum:metanotum 15:8:9. All three segments with broad areas laterally set with fine pits visible in alcohol. Body, legs and antenna covered with very short pubescence. Anterior and posterior femora each with one black spine on dorsal surface at distal three fourths; posterior tibia with six black spines; first and second antennal segments with scattered longer setae. Head long (32), broadened anteriorly to antennal tubercles, wide (24) across tubercles; dorsum with median double parallel lines, joining posteriorly, nearly reaching posterior margin; width of an eye:interocular space/4:20; eyes small compared to *Mesovelia*, roughly faceted, with about 30 to 35 ommatidia. Antennal segment I moderately stout, II slender, III-IV very long and slender; ratio I-IV, 33:28:54:73. Abdominal tergites II-VI subequal in length (10), tergite I shorter (8), tergite VII longer (16); genital segments I and II subequal in length dorsally (12). Median pore at anterior $\frac{1}{3}$ of tergite 4.

All femora stout, tibia and tarsi slender. Proportions of legs:

	Femur	Tibia	Tarsal 1	Tarsal 2	Tarsal 3
Anterior	50	47	3	7	10
Middle	55	58	3	8	12
Posterior	60	80	3	11	13

Male parameres symmetrical, spatulate. Eighth abdominal sternite with two (1 + 1) lateral callosities, each with a small central tubercle embrowned posteriorly.

Length 2.6 mm, width 1 mm (across abdomen). Winged form and female unknown.

Material examined: *Holotype* (apterous ♂), MEXICO, BAJA CALIFORNIA, BAHIA CONCEPCION, BEACH N. OF BAHIA COYOTE, 2 April 1974, #137(2), Vincent F. Lee; 3 nymphs, same data. All specimens are in the California Academy of Sciences, in alcohol.¹

Discussion: This species is clearly a *Speovelia*, being closely allied to *Speovelia maritima* Esaki, but easily distinguished by the processes on the eighth abdominal ventrite. The parameres of *mexicana* are

¹ After this paper went to press, I collected a female of *Speovelia mexicana* new species on the opposite side of the Gulf of California (paratype, apterous ♀, MEXICO, SONORA, SAN CARLOS, CL715, VI-4-1975, J. T. Polhemus; in Polhemus collection). The female is very similar to the male in most respects, except all femora are armed with 1 spine at distal $\frac{3}{4}$, and the posterior tibia has only 3 spines; slightly longer (3.2 mm) and wider (1.4 mm) than male. Ovipositor sheath similar to *Speovelia maritima* Esaki.

The San Carlos specimen was found at midnight skating in a protected tide pool, at low tide, in the same locality frequented by *Enalosalda mexicana* (Van Duzee). Many sea caves and protected coves occur near San Carlos, and a search of these at low tides should result in further collections of this interesting insect.

rather long and slender, spatulate, while those of *maritima* are rather broadly expanded distally.

Habitat notes: Vincent Lee has kindly furnished some notes concerning the habitat of this unusual bug, which I paraphrase here. He stated that the specimens were collected from under rocks atop a gently sloping reef-like area, with a rocky overhang having a 6–8' ceiling height covering the intertidal area. The insects were skimming on the surface of the water that was trapped by the reef after the tide receded.

LITERATURE CITED

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